

SEQUENCE LISTING.txt

SEQUENCE LISTING

<110> Innovations Foundation

<120> Secreted Acid Phosphatase (sapM) is Present Only in Pathogenic Mycobacteria and Expressed Selectively at Phagosomal pH

<130> 4146 0005

<140>

<141>

<150> US 60/416,957

<151> 2002-10-09

<160> 22

<170> PatentIn version 3.0

<210> 1

<211> 500

<212> DNA

<213> Mycobacterium tuberculosis

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cggcaaggcg gcatgcgctt cgtcgaccat ccccaacccc gcccgcaaca caggaaccag 180  
caggggtggc ttggttagcc gcgacccgac cgtctcggcc agcggcgtag ggatcgggac 240  
tggctcgag ggcgcatcgc ggggtggcctc atagatcaac agcagcgtga gctcgcgcag 300  
cgctgcccgg aagccggcgt tgtcgggtgcg ttcgtcacgc agcgtggtca gtcgggcccgc 360  
ggccagtggg tggtaacga catggacctg cacggcggtg aaccctatat aacaatcgtg 420  
gctcgggtccc ctaaaagggg gctgatacgg gtgcgtccat ccgcgcgacc ggtcaacccc 480  
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<210> 2

<211> 500

<212> DNA

<213> Mycobacterium bovis

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cggaaggcg	gcatgcgcct	cgtcgaccat	ccccaacccc	gcccgaaca	caggaaccag	180
caggggtggc	ttggttagcc	gcgacccgac	cgtctcggcc	agcggcgtag	ggatcgggac	240
tggtcgcag	ggcgcatcgc	gggtggcctc	atagatcaac	agcagcgtga	gctcgcgcag	300
cgctgcccgg	aagccggcgt	tgtcgggtgcg	ttcgtcacgc	agcgtggtca	gtcggggccgc	360
ggccagtggg	tggtcaacga	catggacctg	cacggcgttg	aaccctatat	aacaatcgtg	420
gctcgggtccc	ctaaaagggg	gctgatacgg	gtgcgtccat	ccgcgcgacc	ggtcaacccc	480
gtccatatac	tcccggcatg					500

&lt;210&gt; 3

&lt;211&gt; 500

&lt;212&gt; DNA

&lt;213&gt; Mycobacterium avium

&lt;400&gt; 3

gccggtggcc	agcatcgggt	ccagcaccat	caccgacctg	ccggccagct	tgtcgggcag	60
cgccgcaaaa	tacgggaccg	gccggtgggt	ttgctcgtcg	cgggcgacgc	cgacgaagcc	120
cacctcggcc	tcgggcagcg	cggcctgcgc	cgggtcgacc	atgcccagcc	cggcgcgtag	180
caccggaacc	agcagcggcg	gattgaccag	tcgggtcccc	gcggccgcgg	ccaccgggggt	240
gcggatccgg	accgacttgc	gcggcgcgtc	gcggctggcc	tcgtagacca	gcatcagcgt	300
cagatcgcgc	agcgcggccc	gaaatccggc	ggtgtcgggt	cgttcgtcgc	gcagcaccgt	360
cagccggggc	gcggccaacg	ggtgggtcgat	cacgcacacg	tccatctggt	cgagggtata	420
taacgatcgg	gcaaagcccc	gctgacacgc	ttgcccggcg	gccggaaacg	ccttaccgcc	480
gttcgtatac	tccgggctg					500

&lt;210&gt; 4

&lt;211&gt; 500

&lt;212&gt; DNA

&lt;213&gt; Mycobacterium marinum

&lt;400&gt; 4

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gcgattcaag	atatgggacg	ggctgggtggg	tctgctcatt	gcgggcgata	ccgacaaagc	120
cgacccgcgc	ctccggcagc	gccgcatgcg	cttcgtcgac	catgcccagt	ccggcgcgca	180
gcaccggaac	cagaagcggg	gggttgggca	gtcttagggc	tgtcgtggcc	gcaagcgggt	240
tacggatagc	gacggattcg	gtgggcgctg	cgcgggctgc	ctcatagacc	agtaccagt	300
tcagctcacg	caaggccttg	cggaaagcag	cgtttccggg	gcgttcgtca	cgcagcgcgg	360

SEQUENCE LISTING.txt

tcaggcgggc cgccgccagc gggatgatcaa tgacgtggac ttccacatgg gtgaccctat 420  
ataacaatcg gattcaagcc gctgacacgc tccccctcct cgcggcgccg aggccgagcc 480  
gcccataatac tccgggcgtg 500

<210> 5

<211> 43

<212> PRT

<213> Mycobacterium tuberculosis

<400> 5

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Arg Ala Leu Ala Val Ile Gly Val Leu Ala Ala Ser Leu Leu Ala Ser  
20 25 30  
Trp Val Gly Ala Val Pro Gln Val Gly Leu Ala  
35 40

<210> 6

<211> 43

<212> PRT

<213> Mycobacterium bovis

<400> 6

Met Leu Arg Gly Ile Gln Ala Leu Ser Arg Pro Leu Thr Arg Val Tyr  
1 5 10 15  
Arg Ala Leu Ala Val Ile Gly Val Leu Ala Ala Ser Leu Leu Ala Ser  
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Trp Val Gly Ala Val Pro Gln Val Gly Leu Ala  
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<210> 7

<211> 42

<212> PRT

<213> Mycobacterium avium

<400> 7

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Arg Ser Leu Arg Leu Leu Gly Ala Val Ala Ala Val Ala Leu Ala Ala  
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Ser Pro Leu Thr Pro Arg Thr Ser Leu Ala  
35 40

SEQUENCE LISTING.txt

<210> 8

<211> 40

<212> PRT

<213> Mycobacterium marinum

<400> 8

Met Cys Gly Leu Lys Gln Arg Phe Thr Ser Thr Phe Arg Ala Leu Ala  
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Pro Pro Arg Ile Asp Leu Thr Ala  
35 40

<210> 9

<211> 900

<212> DNA

<213> Mycobacterium tuberculosis

<220>

<221> CDS

<222> (1)..(900)

<400> 9

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cgt gcc ttg gcg gtg atc ggt gtc ctg gca gca tcg ttg ctg gcc tca	96
Arg Ala Leu Ala Val Ile Gly Val Leu Ala Ala Ser Leu Leu Ala Ser	
20 25 30	
tgg gtc ggc gct gtc cca caa gtg ggt ctg gca gcg agt gcc ctg ccg	144
Trp Val Gly Ala Val Pro Gln Val Gly Leu Ala Ala Ser Ala Leu Pro	
35 40 45	
acc ttc gcg cac gtg gtc atc gtg gtg gag gag aac cgc tcg cag gcc	192
Thr Phe Ala His Val Val Ile Val Val Glu Glu Asn Arg Ser Gln Ala	
50 55 60	
gcc atc atc ggt aac aag tcg gct ccc ttc atc aat tcg ctg gcc gcc	240
Ala Ile Ile Gly Asn Lys Ser Ala Pro Phe Ile Asn Ser Leu Ala Ala	
65 70 75 80	
aac ggc gcg atg atg gcc cag gcg ttc gcc gaa aca cac ccg agc gaa	288
Asn Gly Ala Met Met Ala Gln Ala Phe Ala Glu Thr His Pro Ser Glu	
85 90 95	
ccg aac tac ctg gca ctg ttc gct ggc aac aca ttc ggg ttg acg aag	336
Pro Asn Tyr Leu Ala Leu Phe Ala Gly Asn Thr Phe Gly Leu Thr Lys	
100 105 110	
aac acc tgc ccc gtc aac ggc ggc gcg ctg ccc aac ctg ggt tct gag	384
Asn Thr Cys Pro Val Asn Gly Gly Ala Leu Pro Asn Leu Gly Ser Glu	
115 120 125	

SEQUENCE LISTING.txt

ttg ctc agc gcc ggt tac aca ttc atg ggg ttc gcc gaa gac ttg cct Leu Leu Ser Ala Gly Tyr Thr Phe Met Gly Phe Ala Glu Asp Leu Pro 130 135 140	432
gcg gtc ggc tcc acg gtg tgc agt gcg ggc aaa tac gca cgc aaa cac Ala Val Gly Ser Thr Val Cys Ser Ala Gly Lys Tyr Ala Arg Lys His 145 150 155 160	480
gtg ccg tgg gtc aac ttc agt aac gtg ccg acg aca ctg tcg gtg ccg Val Pro Trp Val Asn Phe Ser Asn Val Pro Thr Thr Leu Ser Val Pro 165 170 175	528
ttt tcg gca ttt ccg aag ccg cag aat tac ccc ggc ctg ccg acg gtg Phe Ser Ala Phe Pro Lys Pro Gln Asn Tyr Pro Gly Leu Pro Thr Val 180 185 190	576
tcg ttt gtc atc cct aac gcc gac aac gac atg cac gac ggc tcg atc Ser Phe Val Ile Pro Asn Ala Asp Asn Asp Met His Asp Gly Ser Ile 195 200 205	624
gcc caa ggc gac gcc tgg ctg aac cgc cac ctg tcg gca tat gcc aac Ala Gln Gly Asp Ala Trp Leu Asn Arg His Leu Ser Ala Tyr Ala Asn 210 215 220	672
tgg gcc aag aca aac aac agc ctg ctc gtt gtg acc tgg gac gaa gac Trp Ala Lys Thr Asn Asn Ser Leu Leu Val Val Thr Trp Asp Glu Asp 225 230 235 240	720
gac ggc agc agc cgc aat cag atc ccg acg gtg ttc tac ggc gcg cac Asp Gly Ser Ser Arg Asn Gln Ile Pro Thr Val Phe Tyr Gly Ala His 245 250 255	768
gtg cgg ccc gga act tac aac gag acc atc agc cac tac aac gtg ctg Val Arg Pro Gly Thr Tyr Asn Glu Thr Ile Ser His Tyr Asn Val Leu 260 265 270	816
tcc aca ttg gag cag atc tac gga ctg ccc aag acg ggt tat gcg acc Ser Thr Leu Glu Gln Ile Tyr Gly Leu Pro Lys Thr Gly Tyr Ala Thr 275 280 285	864
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<210> 10

<211> 299

<212> PRT

<213> Mycobacterium tuberculosis

<400> 10

Met Leu Arg Gly Ile Gln Ala Leu Ser Arg Pro Leu Thr Arg Val Tyr  
1 5 10 15

Arg Ala Leu Ala Val Ile Gly Val Leu Ala Ala Ser Leu Leu Ala Ser  
20 25 30

Trp Val Gly Ala Val Pro Gln Val Gly Leu Ala Ala Ser Ala Leu Pro  
35 40 45

SEQUENCE LISTING.txt

Thr Phe Ala His Val Val Ile Val Val Glu Glu Asn Arg Ser Gln Ala  
 50 55 60  
 Ala Ile Ile Gly Asn Lys Ser Ala Pro Phe Ile Asn Ser Leu Ala Ala  
 65 70 75 80  
 Asn Gly Ala Met Met Ala Gln Ala Phe Ala Glu Thr His Pro Ser Glu  
 85 90 95  
 Pro Asn Tyr Leu Ala Leu Phe Ala Gly Asn Thr Phe Gly Leu Thr Lys  
 100 105 110  
 Asn Thr Cys Pro Val Asn Gly Gly Ala Leu Pro Asn Leu Gly Ser Glu  
 115 120 125  
 Leu Leu Ser Ala Gly Tyr Thr Phe Met Gly Phe Ala Glu Asp Leu Pro  
 130 135 140  
 Ala Val Gly Ser Thr Val Cys Ser Ala Gly Lys Tyr Ala Arg Lys His  
 145 150 155 160  
 Val Pro Trp Val Asn Phe Ser Asn Val Pro Thr Thr Leu Ser Val Pro  
 165 170 175  
 Phe Ser Ala Phe Pro Lys Pro Gln Asn Tyr Pro Gly Leu Pro Thr Val  
 180 185 190  
 Ser Phe Val Ile Pro Asn Ala Asp Asn Asp Met His Asp Gly Ser Ile  
 195 200 205  
 Ala Gln Gly Asp Ala Trp Leu Asn Arg His Leu Ser Ala Tyr Ala Asn  
 210 215 220  
 Trp Ala Lys Thr Asn Asn Ser Leu Leu Val Val Thr Trp Asp Glu Asp  
 225 230 235 240  
 Asp Gly Ser Ser Arg Asn Gln Ile Pro Thr Val Phe Tyr Gly Ala His  
 245 250 255  
 Val Arg Pro Gly Thr Tyr Asn Glu Thr Ile Ser His Tyr Asn Val Leu  
 260 265 270  
 Ser Thr Leu Glu Gln Ile Tyr Gly Leu Pro Lys Thr Gly Tyr Ala Thr  
 275 280 285  
 Asn Ala Pro Pro Ile Thr Asp Ile Trp Gly Asp  
 290 295

<210> 11

## SEQUENCE LISTING.txt

&lt;211&gt; 900

&lt;212&gt; DNA

&lt;213&gt; Mycobacterium bovis

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(900)

&lt;400&gt; 11

atg	ctc	cgc	gga	atc	cag	gct	ctc	agc	cgg	ccc	ctg	acc	agg	gta	tac	48
Met	Leu	Arg	Gly	Ile	Gln	Ala	Leu	Ser	Arg	Pro	Leu	Thr	Arg	Val	Tyr	
1			5					10						15		

cgt	gcc	ttg	gcg	gtg	atc	ggg	gtc	ctg	gca	gca	tcg	ttg	ctg	gcc	tca	96
Arg	Ala	Leu	Ala	Val	Ile	Gly	Val	Leu	Ala	Ala	Ser	Leu	Leu	Ala	Ser	
			20					25					30			

tgg	gtc	ggc	gct	gtc	cca	caa	gtg	ggg	ctg	gca	gcg	agt	gcc	ctg	ccg	144
Trp	Val	Gly	Ala	Val	Pro	Gln	Val	Gly	Leu	Ala	Ala	Ser	Ala	Leu	Pro	
		35					40					45				

acc	ttc	gcg	cac	gtg	gtc	atc	gtg	gtg	gag	gag	aac	cgc	tcg	cag	gcc	192
Thr	Phe	Ala	His	Val	Val	Ile	Val	Val	Glu	Glu	Asn	Arg	Ser	Gln	Ala	
	50					55					60					

gcc	atc	atc	ggg	aac	aag	tcg	gct	ccc	ttc	atc	aat	tcg	ctg	gcc	gcc	240
Ala	Ile	Ile	Gly	Asn	Lys	Ser	Ala	Pro	Phe	Ile	Asn	Ser	Leu	Ala	Ala	
65					70					75					80	

aac	ggc	gcg	atg	atg	gcc	cag	gcg	ttc	gcc	gaa	aca	cac	ccg	agc	gaa	288
Asn	Gly	Ala	Met	Met	Ala	Gln	Ala	Phe	Ala	Glu	Thr	His	Pro	Ser	Glu	
				85					90					95		

ccg	aac	tac	ctg	gca	ctg	ttc	gct	ggc	aac	aca	ttc	ggg	ttg	acg	aag	336
Pro	Asn	Tyr	Leu	Ala	Leu	Phe	Ala	Gly	Asn	Thr	Phe	Gly	Leu	Thr	Lys	
			100					105					110			

aac	acc	tgc	ccc	gtc	aac	ggc	ggc	gcg	ctg	ccc	aac	ctg	ggg	tct	gag	384
Asn	Thr	Cys	Pro	Val	Asn	Gly	Gly	Ala	Leu	Pro	Asn	Leu	Gly	Ser	Glu	
		115					120					125				

ttg	ctc	agc	gcc	ggg	tac	aca	ttc	atg	ggg	ttc	gcc	gaa	gac	ttg	cct	432
Leu	Leu	Ser	Ala	Gly	Tyr	Thr	Phe	Met	Gly	Phe	Ala	Glu	Asp	Leu	Pro	
	130					135					140					

gcg	gtc	ggc	tcc	acg	gtg	tgc	agt	gcg	ggc	aaa	tac	gca	cgc	aaa	cac	480
Ala	Val	Gly	Ser	Thr	Val	Cys	Ser	Ala	Gly	Lys	Tyr	Ala	Arg	Lys	His	
145					150					155					160	

gtg	ccg	tgg	gtc	aac	ttc	agt	aac	gtg	ccg	gcg	aca	ctg	tcg	gtg	ccg	528
Val	Pro	Trp	Val	Asn	Phe	Ser	Asn	Val	Pro	Ala	Thr	Leu	Ser	Val	Pro	
				165					170					175		

ttt	tcg	gca	ttt	ccg	aag	ccg	cag	aat	tac	ccc	ggc	ctg	ccg	acg	gtg	576
Phe	Ser	Ala	Phe	Pro	Lys	Pro	Gln	Asn	Tyr	Pro	Gly	Leu	Pro	Thr	Val	
			180					185					190			

tcg	ttt	gtc	atc	cct	aac	gcc	gac	aac	gac	atg	cac	gac	ggc	tcg	atc	624
Ser	Phe	Val	Ile	Pro	Asn	Ala	Asp	Asn	Asp	Met	His	Asp	Gly	Ser	Ile	
		195					200					205				

gcc	caa	ggc	gac	gcc	tgg	ctg	aac	cgc	cac	ctg	tcg	gca	tat	gcc	aac	672
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SEQUENCE LISTING.txt

Ala	Gln	Gly	Asp	Ala	Trp	Leu	Asn	Arg	His	Leu	Ser	Ala	Tyr	Ala	Asn		
210						215					220						
tgg	gcc	aag	aca	aac	aac	agc	ctg	ctc	ggt	gtg	acc	tgg	gac	gaa	gac	720	
Trp	Ala	Lys	Thr	Asn	Asn	Ser	Leu	Leu	Val	Val	Thr	Trp	Asp	Glu	Asp		
225					230					235					240		
gac	ggc	agc	agc	cgc	aat	cag	atc	ccg	acg	gtg	ttc	tac	ggc	gcg	cac	768	
Asp	Gly	Ser	Ser	Arg	Asn	Gln	Ile	Pro	Thr	Val	Phe	Tyr	Gly	Ala	His		
				245					250					255			
gtg	cgg	ccc	gga	act	tac	aac	gag	acc	atc	agc	cac	tac	aac	gtg	ctg	816	
Val	Arg	Pro	Gly	Thr	Tyr	Asn	Glu	Thr	Ile	Ser	His	Tyr	Asn	Val	Leu		
			260					265					270				
tcc	aca	ttg	gag	cag	atc	tac	gga	ctg	ccc	aag	acg	ggt	tat	gcg	acc	864	
Ser	Thr	Leu	Glu	Gln	Ile	Tyr	Gly	Leu	Pro	Lys	Thr	Gly	Tyr	Ala	Thr		
		275					280					285					
aat	gct	ccg	cca	ata	acc	gat	att	tgg	ggc	gac	tag					900	
Asn	Ala	Pro	Pro	Ile	Thr	Asp	Ile	Trp	Gly	Asp							
	290					295											

<210> 12  
 <211> 299  
 <212> PRT  
 <213> Mycobacterium bovis

<400> 12

Met	Leu	Arg	Gly	Ile	Gln	Ala	Leu	Ser	Arg	Pro	Leu	Thr	Arg	Val	Tyr
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			20					25					30		
Trp	Val	Gly	Ala	Val	Pro	Gln	Val	Gly	Leu	Ala	Ala	Ser	Ala	Leu	Pro
		35					40					45			
Thr	Phe	Ala	His	Val	Val	Ile	Val	Val	Glu	Glu	Asn	Arg	Ser	Gln	Ala
	50					55					60				
Ala	Ile	Ile	Gly	Asn	Lys	Ser	Ala	Pro	Phe	Ile	Asn	Ser	Leu	Ala	Ala
65					70					75					80
Asn	Gly	Ala	Met	Met	Ala	Gln	Ala	Phe	Ala	Glu	Thr	His	Pro	Ser	Glu
				85					90					95	
Pro	Asn	Tyr	Leu	Ala	Leu	Phe	Ala	Gly	Asn	Thr	Phe	Gly	Leu	Thr	Lys
			100					105					110		
Asn	Thr	Cys	Pro	Val	Asn	Gly	Gly	Ala	Leu	Pro	Asn	Leu	Gly	Ser	Glu
		115					120					125			
Leu	Leu	Ser	Ala	Gly	Tyr	Thr	Phe	Met	Gly	Phe	Ala	Glu	Asp	Leu	Pro



SEQUENCE LISTING.txt

130

135

140

Ala Val Gly Ser Thr Val Cys Ser Ala Gly Lys Tyr Ala Arg Lys His  
145 150 155 160

Val Pro Trp Val Asn Phe Ser Asn Val Pro Ala Thr Leu Ser Val Pro  
165 170 175

Phe Ser Ala Phe Pro Lys Pro Gln Asn Tyr Pro Gly Leu Pro Thr Val  
180 185 190

Ser Phe Val Ile Pro Asn Ala Asp Asn Asp Met His Asp Gly Ser Ile  
195 200 205

Ala Gln Gly Asp Ala Trp Leu Asn Arg His Leu Ser Ala Tyr Ala Asn  
210 215 220

Trp Ala Lys Thr Asn Asn Ser Leu Leu Val Val Thr Trp Asp Glu Asp  
225 230 235 240

Asp Gly Ser Ser Arg Asn Gln Ile Pro Thr Val Phe Tyr Gly Ala His  
245 250 255

Val Arg Pro Gly Thr Tyr Asn Glu Thr Ile Ser His Tyr Asn Val Leu  
260 265 270

Ser Thr Leu Glu Gln Ile Tyr Gly Leu Pro Lys Thr Gly Tyr Ala Thr  
275 280 285

Asn Ala Pro Pro Ile Thr Asp Ile Trp Gly Asp  
290 295

<210> 13

<211> 903

<212> DNA

<213> Mycobacterium avium

<220>

<221> CDS

<222> (1)..(903)

<400> 13

gtg tcg cgc gaa aat cga agt cgc aga agg ctg atc ggc ggc gca tac  
Met Ser Arg Glu Asn Arg Ser Arg Arg Arg Leu Ile Gly Gly Ala Tyr  
1 5 10 15

48

cga agc ctg cgg ctg ctc ggc gcc gtg gcc gcg gtg gcg ctg gcg gcc  
Arg Ser Leu Arg Leu Leu Gly Ala Val Ala Ala Val Ala Leu Ala Ala  
20 25 30

96

## SEQUENCE LISTING.txt

agc Ser	ccg Pro	ttg Leu	aca Thr	ccg Pro	cg Arg	acc Thr	agc Ser	ctt Leu	gcg Ala	gca Ala	gcc Ala	att Ile	ccg Pro	caa Gln	144	
		35					40				45					
ccg Pro	tcg Ser	cac His	atc Ile	gtg Val	atc Ile	gtg Val	gtg Val	gag Glu	gaa Glu	aac Asn	cgt Arg	tcc Ser	gag Glu	agc Ser	ggc Gly	192
	50					55					60					
atc Ile	atc Ile	ggc Gly	aac Asn	aag Lys	tcg Ser	gcg Ala	ccc Pro	ttc Phe	atc Ile	acc Thr	gcg Ala	ctg Leu	gcc Ala	gcg Ala	tcc Ser	240
65					70					75					80	
ggc Gly	gcc Ala	aac Asn	atg Met	acc Thr	cag Gln	tcg Ser	ttc Phe	gcc Ala	gaa Glu	acc Thr	cac His	ccc Pro	agc Ser	gag Glu	ccc Pro	288
				85					90					95		
aat Asn	tac Tyr	ctg Leu	gcg Ala	ctg Leu	ttc Phe	gcc Ala	ggc Gly	aac Asn	acg Thr	ttc Phe	ggg Gly	gtg Val	acc Thr	aag Lys	gac Asp	336
			100					105					110			
ctg Leu	tgc Cys	ccg Pro	gtc Val	aac Asn	gcc Ala	ggc Gly	gcc Ala	gca Ala	ccc Pro	aac Asn	ctg Leu	ggg Gly	tcc Ser	gaa Glu	ttg Leu	384
		115					120					125				
ctc Leu	gcc Ala	gcc Ala	ggc Gly	tac Tyr	aca Thr	ttc Phe	gcc Ala	ggc Gly	tac Tyr	gcc Ala	gag Glu	ggc Gly	ctg Leu	ccg Pro	tcc Ser	432
	130					135					140					
ccg Pro	ggc Gly	tca Ser	ccg Pro	gtg Val	tgc Cys	agt Ser	gcg Ala	ggc Gly	aag Lys	tac Tyr	gcg Ala	cga Arg	aaa Lys	cat His	gtg Val	480
145					150					155					160	
ccg Pro	tgg Trp	gcc Ala	aac Asn	ttc Phe	acc Thr	aac Asn	gtg Val	ccg Pro	gcg Ala	gcg Ala	agc Ser	tcg Ser	ctg Leu	ccg Pro	ttc Phe	528
				165					170					175		
tcg Ser	gcg Ala	ttc Phe	ccg Pro	atg Met	ggc Gly	aac Asn	tac Tyr	gcc Ala	agc Ser	ctg Leu	ccg Pro	acg Thr	gtg Val	tcg Ser	ttc Phe	576
			180					185					190			
gtc Val	atc Ile	ccg Pro	aac Asn	aac Asn	gac Asp	aac Asn	atg Met	cac His	gac Asp	ggc Gly	tcg Ser	atc Ile	gcg Ala	cag Gln		624
		195				200					205					
gcc Ala	gac Asp	gcc Ala	tgg Trp	ctg Leu	aac Asn	ccg Arg	cag Gln	ctg Leu	tcc Ser	ggc Gly	tac Tyr	gcc Ala	aat Asn	tgg Trp	gcg Ala	672
	210					215					220					
ctg Leu	gcc Ala	aac Asn	aac Asn	agc Ser	ctg Leu	ctg Leu	atc Ile	gtc Val	acc Thr	ttc Phe	gac Asp	gag Glu	gac Asp	gac Asp	aac Asn	720
225					230					235					240	
tcc Ser	aac Asn	gtc Val	gga Gly	gcc Ala	agc Ser	cg Arg	aac Asn	cag Gln	atc Ile	ccc Pro	acg Thr	gtg Val	ttc Phe	tac Tyr	ggc Gly	768
			245						250					255		
gcc Ala	cac His	gtc Val	cg Arg	ccc Pro	ggc Gly	aac Asn	tac Tyr	gcc Ala	gag Glu	cag Gln	atc Ile	aac Asn	cac His	tac Tyr	aac Asn	816
			260					265					270			
gtg Val	ctt Leu	gcc Ala	acc Thr	ctc Leu	gag Glu	cag Gln	atg Met	tac Tyr	ggg Gly	ctg Leu	ccc Pro	aag Lys	acg Thr	ggc Gly	tat Tyr	864
		275					280					285				
gcc Ala	gcc Ala	ggc Gly	gcc Ala	gcc Ala	ccc Pro	atc Ile	acc Thr	gac Asp	atc Ile	tgg Trp	ggc Gly	tga				903
	290					295					300					

SEQUENCE LISTING.txt

<210> 14

<211> 300

<212> PRT

<213> Mycobacterium avium

<400> 14

Met Ser Arg Glu Asn Arg Ser Arg Arg Arg Leu Ile Gly Gly Ala Tyr  
1 5 10 15

Arg Ser Leu Arg Leu Leu Gly Ala Val Ala Ala Val Ala Leu Ala Ala  
20 25 30

Ser Pro Leu Thr Pro Arg Thr Ser Leu Ala Ala Ala Ala Ile Pro Gln  
35 40 45

Pro Ser His Ile Val Ile Val Val Glu Glu Asn Arg Ser Glu Ser Gly  
50 55 60

Ile Ile Gly Asn Lys Ser Ala Pro Phe Ile Thr Ala Leu Ala Ala Ser  
65 70 75 80

Gly Ala Asn Met Thr Gln Ser Phe Ala Glu Thr His Pro Ser Glu Pro  
85 90 95

Asn Tyr Leu Ala Leu Phe Ala Gly Asn Thr Phe Gly Val Thr Lys Asp  
100 105 110

Leu Cys Pro Val Asn Ala Gly Ala Ala Pro Asn Leu Gly Ser Glu Leu  
115 120 125

Leu Ala Ala Gly Tyr Thr Phe Ala Gly Tyr Ala Glu Gly Leu Pro Ser  
130 135 140

Pro Gly Ser Pro Val Cys Ser Ala Gly Lys Tyr Ala Arg Lys His Val  
145 150 155 160

Pro Trp Ala Asn Phe Thr Asn Val Pro Ala Ala Ser Ser Leu Pro Phe  
165 170 175

Ser Ala Phe Pro Met Gly Asn Tyr Ala Ser Leu Pro Thr Val Ser Phe  
180 185 190

Val Ile Pro Asn Asn Asp Asn Asn Met His Asp Gly Ser Ile Ala Gln  
195 200 205

Ala Asp Ala Trp Leu Asn Arg Gln Leu Ser Gly Tyr Ala Asn Trp Ala  
210 215 220

SEQUENCE LISTING.txt

Leu Ala Asn Asn Ser Leu Leu Ile Val Thr Phe Asp Glu Asp Asp Asn  
225 230 235 240

Ser Asn Val Gly Ala Ser Arg Asn Gln Ile Pro Thr Val Phe Tyr Gly  
245 250 255

Ala His Val Arg Pro Gly Asn Tyr Ala Glu Gln Ile Asn His Tyr Asn  
260 265 270

Val Leu Ala Thr Leu Glu Gln Met Tyr Gly Leu Pro Lys Thr Gly Tyr  
275 280 285

Ala Ala Gly Ala Ala Pro Ile Thr Asp Ile Trp Gly  
290 295 300

<210> 15

<211> 888

<212> DNA

<213> Mycobacterium marinum

<220>

<221> CDS

<222> (1)..(888)

<400> 15

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Met	Cys	Gly	Leu	Lys	Gln	Arg	Phe	Thr	Ser	Thr	Phe	Arg	Ala	Leu	Ala	
1				5					10					15		

gta	ctc	ggc	gcg	gtg	gcg	gta	tcc	cta	ccg	gcc	cac	ggt	agc	gac	gct	96
Val	Leu	Gly	Ala	Val	Ala	Val	Ser	Leu	Pro	Ala	His	Gly	Ser	Asp	Ala	
			20					25					30			

ccc	ccg	cgt	atc	gac	ctg	acc	gcc	act	gcg	ttg	ccg	gcg	ttc	tca	cat	144
Pro	Pro	Arg	Ile	Asp	Leu	Thr	Ala	Thr	Ala	Leu	Pro	Ala	Phe	Ser	His	
		35					40					45				

gtg	gtg	gtc	gtg	gtg	gag	gag	aac	cat	tcg	cag	gcc	aac	atc	att	ggc	192
Val	Val	Val	Val	Val	Glu	Glu	Asn	His	Ser	Gln	Ala	Asn	Ile	Ile	Gly	
	50					55					60					

aac	aag	gcg	gcc	ccg	ttc	atc	aat	gcg	ctg	gcc	gcc	aat	ggc	gcg	atg	240
Asn	Lys	Ala	Ala	Pro	Phe	Ile	Asn	Ala	Leu	Ala	Ala	Asn	Gly	Ala	Met	
65					70				75						80	

atg	tcg	cag	tcg	ttc	gcc	gaa	acg	cac	ccc	agc	gaa	ccc	aac	tac	ctg	288
Met	Ser	Gln	Ser	Phe	Ala	Glu	Thr	His	Pro	Ser	Glu	Pro	Asn	Tyr	Leu	
				85					90					95		

gcc	ttg	ttc	gcc	ggt	acc	acc	ttc	ggc	ttg	aag	aag	aac	acg	tgt	ccg	336
Ala	Leu	Phe	Ala	Gly	Thr	Thr	Phe	Gly	Leu	Lys	Lys	Asn	Thr	Cys	Pro	
			100					105					110			

gtc	aat	gcg	ggc	agc	acg	ccc	aac	ctg	gct	tcg	gag	ttg	ctc	gcc	gcg	384
Val	Asn	Ala	Gly	Ser	Thr	Pro	Asn	Leu	Ala	Ser	Glu	Leu	Leu	Ala	Ala	

SEQUENCE LISTING.txt

115	120	125	
ggc cac acg ttc gta ggt ttc ggc gag agc ctg ccc gaa gtc ggt tcg Gly His Thr Phe Val Gly Phe Ala Glu Ser Leu Pro Glu Val Gly Ser 130 135 140			432
acg gtc tgc agc gcc gga aag tac ggg cgc aag cat gcg cct tgg gtg Thr Val Cys Ser Ala Gly Lys Tyr Gly Arg Lys His Ala Pro Trp Val 145 150 155 160			480
aac ttc agc aat gtt ccg gcc acg ctg tcg atg ccc ttc tcc gcg ttt Asn Phe Ser Asn Val Pro Ala Thr Leu Ser Met Pro Phe Ser Ala Phe 165 170 175			528
ccg acg ccg gcg gac tac gcc agg ctg ccc acg gtg tcc ttc gtc atc Pro Thr Pro Ala Asp Tyr Ala Arg Leu Pro Thr Val Ser Phe Val Ile 180 185 190			576
ccc aac ggg gat aac aac atg cac gac ggc acc atc gcg gca gct gac Pro Asn Gly Asp Asn Asn Met His Asp Gly Thr Ile Ala Ala Ala Asp 195 200 205			624
gag tgg ttg aac cgt caa ctg tcg ccg tac gcc aac tgg gcc cga tcc Glu Trp Leu Asn Arg Gln Leu Ser Pro Tyr Ala Asn Trp Ala Arg Ser 210 215 220			672
aac aac agc ctg ctg atc gtg acg tgg gat gag gac gac ggc ggc agc Asn Asn Ser Leu Leu Ile Val Thr Trp Asp Glu Asp Asp Gly Gly Ser 225 230 235 240			720
cgc aac cag att ccc acg gtg ttc tac ggc gca cac gta cgg ccg ggc Arg Asn Gln Ile Pro Thr Val Phe Tyr Gly Ala His Val Arg Pro Gly 245 250 255			768
act tac aac cag acc atc agc cac tac aac gtg ctt tcc acg ctg gag Thr Tyr Asn Gln Thr Ile Ser His Tyr Asn Val Leu Ser Thr Leu Glu 260 265 270			816
cag atg tac ggc ttg ccc aag acg ggt ttc gcg gcg aac gcc ccg gtc Gln Met Tyr Gly Leu Pro Lys Thr Gly Phe Ala Ala Asn Ala Pro Val 275 280 285			864
atc gct gat atc tgg ggc ggc taa Ile Ala Asp Ile Trp Gly Gly 290 295			888

<210> 16

<211> 295

<212> PRT

<213> Mycobacterium marinum

<400> 16

Met Cys Gly Leu Lys Gln Arg Phe Thr Ser Thr Phe Arg Ala Leu Ala  
1 5 10 15

Val Leu Gly Ala Val Ala Val Ser Leu Pro Ala His Gly Ser Asp Ala  
20 25 30

Pro Pro Arg Ile Asp Leu Thr Ala Thr Ala Leu Pro Ala Phe Ser His  
Page 13

## SEQUENCE LISTING.txt

35

40

45

Val Val Val Val Val Glu Glu Asn His Ser Gln Ala Asn Ile Ile Gly  
 50 55 60  
 Asn Lys Ala Ala Pro Phe Ile Asn Ala Leu Ala Ala Asn Gly Ala Met  
 65 70 75 80  
 Met Ser Gln Ser Phe Ala Glu Thr His Pro Ser Glu Pro Asn Tyr Leu  
 85 90 95  
 Ala Leu Phe Ala Gly Thr Thr Phe Gly Leu Lys Lys Asn Thr Cys Pro  
 100 105 110  
 Val Asn Ala Gly Ser Thr Pro Asn Leu Ala Ser Glu Leu Leu Ala Ala  
 115 120 125  
 Gly His Thr Phe Val Gly Phe Ala Glu Ser Leu Pro Glu Val Gly Ser  
 130 135 140  
 Thr Val Cys Ser Ala Gly Lys Tyr Gly Arg Lys His Ala Pro Trp Val  
 145 150 155 160  
 Asn Phe Ser Asn Val Pro Ala Thr Leu Ser Met Pro Phe Ser Ala Phe  
 165 170 175  
 Pro Thr Pro Ala Asp Tyr Ala Arg Leu Pro Thr Val Ser Phe Val Ile  
 180 185 190  
 Pro Asn Gly Asp Asn Asn Met His Asp Gly Thr Ile Ala Ala Ala Asp  
 195 200 205  
 Glu Trp Leu Asn Arg Gln Leu Ser Pro Tyr Ala Asn Trp Ala Arg Ser  
 210 215 220  
 Asn Asn Ser Leu Leu Ile Val Thr Trp Asp Glu Asp Asp Gly Gly Ser  
 225 230 235 240  
 Arg Asn Gln Ile Pro Thr Val Phe Tyr Gly Ala His Val Arg Pro Gly  
 245 250 255  
 Thr Tyr Asn Gln Thr Ile Ser His Tyr Asn Val Leu Ser Thr Leu Glu  
 260 265 270  
 Gln Met Tyr Gly Leu Pro Lys Thr Gly Phe Ala Ala Asn Ala Pro Val  
 275 280 285  
 Ile Ala Asp Ile Trp Gly Gly  
 290 295

&lt;210&gt; 17

SEQUENCE LISTING.txt

<211> 1291

<212> DNA

<213> Penicillium chrysogenum

<220>

<221> CDS

<222> (1)..(213)

<220>

<221> intro

<222> (217)..(244)

<220>

<221> CDS

<222> (245)..(1288)

<400> 17	
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Met Leu Thr Lys Gln Thr Leu Leu Ala Phe Val Gly Ala Leu Ala Leu	
1 5 10 15	
gcc acg ggt aca act acc act gaa gag acc cca act cag gct gag att	96
Ala Thr Gly Thr Thr Thr Thr Glu Glu Thr Pro Thr Gln Ala Glu Ile	
20 25 30	
gat gca gca cgt gct acg gcc ctg cct tac tct cct gtg tca aac gta	144
Asp Ala Ala Arg Ala Thr Ala Leu Pro Tyr Ser Pro Val Ser Asn Val	
35 40 45	
aag ggt ttg gcc ttt gat cgt ttc gtg aac atc tgg ctc gag aac aca	192
Lys Gly Leu Ala Phe Asp Arg Phe Val Asn Ile Trp Leu Glu Asn Thr	
50 55 60	
gta ggt ttc ccg ttg aat ata taacaatgac cacgcgctca cccctttgta g	244
Val Gly Phe Pro Leu Asn Ile	
65 70	
gac ttt gaa ccc gct gct tta gac gag aac ctg tcc aag ctg gcc aag	292
Asp Phe Glu Pro Ala Ala Leu Asp Glu Asn Leu Ser Lys Leu Ala Lys	
75 80 85	
gag ggt atc ctc ctg acc aac tac ttt gcc atc tct cac ccc tcg cag	340
Glu Gly Ile Leu Leu Thr Asn Tyr Phe Ala Ile Ser His Pro Ser Gln	
90 95 100	
ccc aac tac tgt gct tcc gcc ggg ggt gac aca ttc ggc atg gat aat	388
Pro Asn Tyr Cys Ala Ser Ala Gly Gly Asp Thr Phe Gly Met Asp Asn	
105 110 115	
gac gac ttc cta caa atc cct tcg aat gtc tca act att gcc gat ctc	436
Asp Asp Phe Leu Gln Ile Pro Ser Asn Val Ser Thr Ile Ala Asp Leu	

## SEQUENCE LISTING.txt

120		125		130		135	
ttt gat act aag cac atc tct tgg ggt gaa tac caa gaa gac atg ccc	Phe Asp Thr Lys His 140	Ile Ser Trp Gly Glu 145	Tyr Gln Glu Asp Met 150				484
tat gct ggc tac caa ggc aaa cgg tat ccc ctc agc ggt ccg aac cag	Tyr Ala Gly Tyr 155	Gln Gly Lys Arg Tyr 160	Pro Leu Ser Gly Pro 165				532
tac gtg cgc aag cac aac ccg ctg gtt ttg ttt aac tcg gtt acc gac	Tyr Val Arg Lys His Asn Pro Leu Val 175	Leu Phe Asn Ser Val Thr Asp 180					580
gac gcc gtg cgc ccg cgc caa atc aag aat ttc acc act ttc tac gac	Asp Ala Val Arg Pro Arg Gln Ile Lys Asn Phe Thr 185	Thr Phe Tyr Asp 195					628
gat ctg aag cac cac agc ctt ccc caa cac atg ttc atc aca ccg aac	Asp Leu Lys His His Ser 200	Leu Pro Gln His Met 205	Phe Ile Thr Pro Asn 210				676
atg acc aat gac gcc cac gac acg aac atc act gtg gcc ggt aac tgg	Met Thr Asn Asp Ala 220	His Asp Thr Asn Ile Thr Val Ala Gly Asn Trp 225					724
gtc gat cgc ttc ctg tct cct cta ctg aag aac gag tac ttc acc aag	Val Asp Arg Phe 235	Leu Ser Pro Leu Lys Asn Glu Tyr Phe Thr Lys 240					772
gac agc cta gtg cta ctc acc ttt gac gag gga gac acc tac tcc tac	Asp Ser Leu Val Leu Leu Thr Phe 250	Asp Glu Gly Asp Thr Tyr Ser Tyr 255					820
ccc aac cgg gtc ttc agc ttc ctt gtt gga ggt gct atc cca gag cac	Pro Asn Arg Val Phe Ser Phe 265	Leu Val Gly Gly Ala Ile Pro Glu His 270					868
ctg aag ggg acc act gac gac act ttc tac acc cac tac tca att gtc	Leu Lys Gly Thr Thr Asp 280	Asp Thr Phe Tyr Thr His Tyr Ser Ile Val 285					916
gct tcc ctg tct gct aac tgg ggt tta ccc tcg ctt ggt cgc tgg gat	Ala Ser Leu Ser Ala Asn Trp Gly Leu Pro Ser Leu Gly Arg Trp 290						964
tgt ggc gcc aac ctg ctg aag atg gtc gct gac aag acc ggc tat gtc	Cys Gly Ala Asn Leu Leu Lys Met Val 300	Ala Asp Lys Thr Gly Tyr Val 305					1012
aac tgg gaa gtt gat acc agc aat gtc tac ctc aac gag act tac cct	Asn Trp Glu Val Asp Thr Ser Asn Val Tyr Leu Asn Glu Thr Tyr Pro 310						1060
gga cct atg tct acc gac aac tat tcc tct aag tgg gcc gtt cct gcc	Gly Pro Met Ser Thr Asp Asn Tyr Ser Ser Lys Trp Ala Val Pro Ala 315						1108
acc aag ggc aaa tgc tct gct ggc cat ggc att gct gag gtc gtg aag	Thr Lys Gly Lys Cys Ser 320	Ala Gly His Gly Ile Ala Glu Val Val Lys 325					1156
aat acc tac cac ggg ctt caa ccc acc tac gac tat gcc agc cct gta	Asn Thr Tyr His Gly Leu Gln Pro Thr Tyr Asp Tyr Ala Ser Pro Val 330						1204
ccg tat gac gtg acc agt gga aac aac gtc ggc atc aag tac cac cgc	Pro Tyr Asp Val Thr Ser Gly Asn Asn Val Gly Ile Lys Tyr His Arg 335						1252



SEQUENCE LISTING.txt

395

400

405

act ctg gta tgt atc ctt tca tgt tct tcc ctt tca tga  
Thr Leu Val Cys Ile Leu Ser Cys Ser Ser Leu Ser  
410 415

1291

<210> 18

<211> 71

<212> PRT

<213> Penicillium chrysogenum

<400> 18

Met Leu Thr Lys Gln Thr Leu Leu Ala Phe Val Gly Ala Leu Ala Leu  
1 5 10 15

Ala Thr Gly Thr Thr Thr Thr Glu Glu Thr Pro Thr Gln Ala Glu Ile  
20 25 30

Asp Ala Ala Arg Ala Thr Ala Leu Pro Tyr Ser Pro Val Ser Asn Val  
35 40 45

Lys Gly Leu Ala Phe Asp Arg Phe Val Asn Ile Trp Leu Glu Asn Thr  
50 55 60

Val Gly Phe Pro Leu Asn Ile  
65 70

<210> 19

<211> 348

<212> PRT

<213> Penicillium chrysogenum

<400> 19

Asp Phe Glu Pro Ala Ala Leu Asp Glu Asn Leu Ser Lys Leu Ala Lys  
1 5 10 15

Glu Gly Ile Leu Leu Thr Asn Tyr Phe Ala Ile Ser His Pro Ser Gln  
20 25 30

Pro Asn Tyr Cys Ala Ser Ala Gly Gly Asp Thr Phe Gly Met Asp Asn  
35 40 45

Asp Asp Phe Leu Gln Ile Pro Ser Asn Val Ser Thr Ile Ala Asp Leu  
50 55 60

Phe Asp Thr Lys His Ile Ser Trp Gly Glu Tyr Gln Glu Asp Met Pro

## SEQUENCE LISTING.txt

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65                               70                               75                               80
Tyr Ala Gly Tyr Gln Gly Lys Arg Tyr Pro Leu Ser Gly Pro Asn Gln
85                               90                               95
Tyr Val Arg Lys His Asn Pro Leu Val Leu Phe Asn Ser Val Thr Asp
100                              105                              110
Asp Ala Val Arg Pro Arg Gln Ile Lys Asn Phe Thr Thr Phe Tyr Asp
115                              120                              125
Asp Leu Lys His His Ser Leu Pro Gln His Met Phe Ile Thr Pro Asn
130                              135                              140
Met Thr Asn Asp Ala His Asp Thr Asn Ile Thr Val Ala Gly Asn Trp
145                              150                              155
Val Asp Arg Phe Leu Ser Pro Leu Leu Lys Asn Glu Tyr Phe Thr Lys
165                              170                              175
Asp Ser Leu Val Leu Leu Thr Phe Asp Glu Gly Asp Thr Tyr Ser Tyr
180                              185                              190
Pro Asn Arg Val Phe Ser Phe Leu Val Gly Gly Ala Ile Pro Glu His
195                              200                              205
Leu Lys Gly Thr Thr Asp Asp Thr Phe Tyr Thr His Tyr Ser Ile Val
210                              215                              220
Ala Ser Leu Ser Ala Asn Trp Gly Leu Pro Ser Leu Gly Arg Trp Asp
225                              230                              235
Cys Gly Ala Asn Leu Leu Lys Met Val Ala Asp Lys Thr Gly Tyr Val
245                              250                              255
Asn Trp Glu Val Asp Thr Ser Asn Val Tyr Leu Asn Glu Thr Tyr Pro
260                              265                              270
Gly Pro Met Ser Thr Asp Asn Tyr Ser Ser Lys Trp Ala Val Pro Ala
275                              280                              285
Thr Lys Gly Lys Cys Ser Ala Gly His Gly Ile Ala Glu Val Val Lys
290                              295                              300
Asn Thr Tyr His Gly Leu Gln Pro Thr Tyr Asp Tyr Ala Ser Pro Val
305                              310                              315
Pro Tyr Asp Val Thr Ser Gly Asn Asn Val Gly Ile Lys Tyr His Arg
325                              330                              335
Thr Leu Val Cys Ile Leu Ser Cys Ser Ser Leu Ser

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SEQUENCE LISTING.txt  
345

340

<210> 20  
<211> 1457  
<212> DNA  
<213> Aspergillus fumigatus

<220>  
<221> CDS  
<222> (1)..(186)

<220>  
<221> Intron  
<222> (187)..(239)

<220>  
<221> CDS  
<222> (240)..(301)

<220>  
<221> Intron  
<222> (302)..(361)

<220>  
<221> CDS  
<222> (362)..(1454)

<400>	20	
atg aag cct tcc gtc gcg act ttg ctt gcc act gtc tct ctg gtc tat		48
Met Lys Pro Ser Val Ala Thr Leu Leu Ala Thr Val Ser Leu Val Tyr		
1 5 10 15		
gct cag act gct act gag aag gag cct tcg ctg tct gcg ata gaa tct		96
Ala Gln Thr Ala Thr Glu Lys Glu Pro Ser Leu Ser Ala Ile Glu Ser		
20 25 30		
gca gca gcc tcc atc cag cct tac tct ccc gtt tcg aac gtt gag ggt		144
Ala Ala Ala Ser Ile Gln Pro Tyr Ser Pro Val Ser Asn Val Glu Gly		
35 40 45		
gtt gca ttt aat cgc ttc ttc caa gtg tgg ctt gag aat att		186
Val Ala Phe Asn Arg Phe Phe Gln Val Trp Leu Glu Asn Ile		

## SEQUENCE LISTING.txt

50	55	60	
gtatgtgatac accttaccaa tcagagaatc ttgtttcaaag ctgacctcag aag gat			242
		Asp	
tac gag gat gct gcg gcg gat gag aac atg aaa tgg ctg gcc tcg caa			290
Tyr Glu Asp Ala Ala Ala Asp Glu Asn Met Lys Trp Leu Ala Ser Gln			
65	70	75	
ggg atc ctg ct gtaagacctc atatcggcca tctgctcacg atttgaactt			341
Gly Ile Leu Leu			
80			
cgaactaatt tactccacag c acc aat ttc tat gca gtc acg cat cct tca			392
	Thr	Asn	Phe
	85		
		Tyr	Ala
		Val	Thr
		90	
		His	Pro
		Ser	
gag cca aac tac tgc gct gct gtt gga ggc gac aca ttt ggc atg gac			440
Glu Pro Asn Tyr Cys Ala Ala Val Gly Gly Asp Thr Phe Gly Met Asp			
95	100	105	
aat gac aac ttt aac cag att cct gcc aat gtt tct act gtc gct gat			488
Asn Asp Asn Phe Asn Gln Ile Pro Ala Asn Val Ser Thr Val Ala Asp			
110	115	120	125
ctc ctg gac acc aaa aac att gct tgg gga gag tat cag gag cac tta			536
Leu Leu Asp Thr Lys Asn Ile Ala Trp Gly Glu Tyr Gln Glu His Leu			
	130	135	140
cct tat ccc gga ttc caa ggt ttc aac tat tcc aac cag gag act tat			584
Pro Tyr Pro Gly Phe Gln Gly Phe Asn Tyr Ser Asn Gln Glu Thr Tyr			
	145	150	155
gtc aat gac tat gtg cgc aag cat aac cca ctg gtc ttg tat gac tct			632
Val Asn Asp Tyr Val Arg Lys His Asn Pro Leu Val Leu Tyr Asp Ser			
	160	165	170
gtc acc aag aac agc act cgt ttg cgc cag atc aag aac ttt acc agc			680
Val Thr Lys Asn Ser Thr Arg Leu Arg Gln Ile Lys Asn Phe Thr Ser			
	175	180	185
ttc gag gac gac ctg gcc aac aag aaa ctt cct caa tgg gca ttt atc			728
Phe Glu Asp Asp Leu Ala Asn Lys Lys Leu Pro Gln Trp Ala Phe Ile			
190	195	200	205
act cca aac atg acc aac gac gct cat gac acc aac att act ttc gga			776
Thr Pro Asn Met Thr Asn Asp Ala His Asp Thr Asn Ile Thr Phe Gly			
	210	215	220
gcc aaa tgg gag cga agc tgg att gcg ccc ttg ctc aac aac tca tac			824
Ala Lys Trp Glu Arg Ser Trp Ile Ala Pro Leu Leu Asn Asn Ser Tyr			
	225	230	235
ttc atg aat gat acc cta atc cta ctt acc ttt gat gag gat ggc act			872
Phe Met Asn Asp Thr Leu Ile Leu Leu Thr Phe Asp Glu Asp Gly Thr			
	240	245	250
tat tcc aag agc aac aag atc ttc agt gtt ctt ctc ggt ggt gcc att			920
Tyr Ser Lys Ser Asn Lys Ile Phe Ser Val Leu Leu Gly Gly Ala Ile			
	255	260	265
ccc gat gag ctg aag ggt act cag gac gat acg ttc tat acc cac tac			968
Pro Asp Glu Leu Lys Gly Thr Gln Asp Asp Thr Phe Tyr Thr His Tyr			
270	275	280	285
tca gtg att gcg tcc gtg tcc gcg aac tgg ggc ctt cct tcg ttg gga			1016
Ser Val Ile Ala Ser Val Ser Ala Asn Trp Gly Leu Pro Ser Leu Gly			

SEQUENCE LISTING.txt

290	295	300	
agg tgg gat tgt ggt gcg aac att ctt gag att gtg gca aac aag acg	Arg Trp Asp Cys 305	Gly Ala Asn Ile Leu Glu Ile Val Ala Asn Lys Thr	1064
gga tat gtc aac tac gac gtt gac aca acc aat ctc cgc ctc aac gag	Gly Tyr Val Asn Tyr Asp Val Asp Thr Thr Asn Leu Arg 330	Leu Asn Glu	1112
acc tac ccc ggt ccc atg tca gcg ggc gaa tac tcg aaa tac tcc cct	Thr Tyr Pro Gly Pro Met Ser Ala Gly Glu Tyr Ser Lys Tyr Ser Pro		1160
gtc tgg ccg aat gcc ttg acc cgt ggt gac tgc tct gct ggc cat ggc	Val Trp Pro Asn Ala Leu Thr Arg Gly Asp Cys Ser Ala Gly His Gly 365		1208
att ttg gac att gtc aag gag acc tac gcc aac acg gag cca aca tac	Ile Leu Asp Ile Val Lys Glu Thr Tyr Ala Asn Thr Glu Pro Thr Tyr 380		1256
aac tat tcg agc ccc ttc cca tat gac act gcg agc aac tac aac acc	Asn Tyr Ser Ser Pro Phe Pro Tyr Asp Thr Ala Ser Asn Tyr Asn Thr 395		1304
aag gtg act gcc acc aaa aag aat gtc acc ggt aca cat aga agt tct	Lys Val Thr Ala Thr Lys Lys Asn Val Thr Gly Thr His Arg Ser Ser 410		1352
tct tcc tcc tct ccg tca gct agc tcc aac gcc gct gtt tct gct gtc	Ser Ser Ser Ser Pro Ser Ala Ser Ser Asn Ala Ala Val Ser Ala Val 425		1400
gct cct gca gcc ggt gtc tct ggt ctc ctc ttg gga ctc gct cta aac	Ala Pro Ala Ala Gly Val Ser Gly Leu Leu Leu Gly Leu Ala Leu Asn 445		1448
ctg ctt taa	Leu Leu		1457

<210> 21

<211> 447

<212> PRT

<213> Aspergillus fumigatus

<400> 21

Met Lys Pro Ser Val Ala Thr Leu Leu Ala Thr Val Ser Leu Val Tyr  
1 5 10 15

Ala Gln Thr Ala Thr Glu Lys Glu Pro Ser Leu Ser Ala Ile Glu Ser  
20 25 30

Ala Ala Ala Ser Ile Gln Pro Tyr Ser Pro Val Ser Asn Val Glu Gly  
35 40 45

## SEQUENCE LISTING.txt

Val Ala Phe Asn Arg Phe Phe Gln Val Trp Leu Glu Asn Ile Asp Tyr  
 50 55 60  
 Glu Asp Ala Ala Ala Asp Glu Asn Met Lys Trp Leu Ala Ser Gln Gly  
 65 70 75 80  
 Ile Leu Leu Thr Asn Phe Tyr Ala Val Thr His Pro Ser Glu Pro Asn  
 85 90 95  
 Tyr Cys Ala Ala Val Gly Gly Asp Thr Phe Gly Met Asp Asn Asp Asn  
 100 105 110  
 Phe Asn Gln Ile Pro Ala Asn Val Ser Thr Val Ala Asp Leu Leu Asp  
 115 120 125  
 Thr Lys Asn Ile Ala Trp Gly Glu Tyr Gln Glu His Leu Pro Tyr Pro  
 130 135 140  
 Gly Phe Gln Gly Phe Asn Tyr Ser Asn Gln Glu Thr Tyr Val Asn Asp  
 145 150 155 160  
 Tyr Val Arg Lys His Asn Pro Leu Val Leu Tyr Asp Ser Val Thr Lys  
 165 170 175  
 Asn Ser Thr Arg Leu Arg Gln Ile Lys Asn Phe Thr Ser Phe Glu Asp  
 180 185 190  
 Asp Leu Ala Asn Lys Lys Leu Pro Gln Trp Ala Phe Ile Thr Pro Asn  
 195 200 205  
 Met Thr Asn Asp Ala His Asp Thr Asn Ile Thr Phe Gly Ala Lys Trp  
 210 215 220  
 Glu Arg Ser Trp Ile Ala Pro Leu Leu Asn Asn Ser Tyr Phe Met Asn  
 225 230 235 240  
 Asp Thr Leu Ile Leu Leu Thr Phe Asp Glu Asp Gly Thr Tyr Ser Lys  
 245 250 255  
 Ser Asn Lys Ile Phe Ser Val Leu Leu Gly Gly Ala Ile Pro Asp Glu  
 260 265 270  
 Leu Lys Gly Thr Gln Asp Asp Thr Phe Tyr Thr His Tyr Ser Val Ile  
 275 280 285  
 Ala Ser Val Ser Ala Asn Trp Gly Leu Pro Ser Leu Gly Arg Trp Asp  
 290 295 300  
 Cys Gly Ala Asn Ile Leu Glu Ile Val Ala Asn Lys Thr Gly Tyr Val  
 305 310 315 320

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Asn Tyr Asp Val Asp Thr Thr Asn Leu Arg Leu Asn Glu Thr Tyr Pro  
 325 330 335

Gly Pro Met Ser Ala Gly Glu Tyr Ser Lys Tyr Ser Pro Val Trp Pro  
 340 345 350

Asn Ala Leu Thr Arg Gly Asp Cys Ser Ala Gly His Gly Ile Leu Asp  
 355 360 365

Ile Val Lys Glu Thr Tyr Ala Asn Thr Glu Pro Thr Tyr Asn Tyr Ser  
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Ser Pro Phe Pro Tyr Asp Thr Ala Ser Asn Tyr Asn Thr Lys Val Thr  
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Ala Thr Lys Lys Asn Val Thr Gly Thr His Arg Ser Ser Ser Ser Ser  
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Ala Gly Val Ser Gly Leu Leu Leu Gly Leu Ala Leu Asn Leu Leu  
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Asn Asp Met His Asp Gly Ser Ile  
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